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## **Nuclear Forensics in the Republic of Tajikistan: Condition and Perspectives**

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During the Soviet era, Tajikistan reprocessed approximately 1 million tons of uranium ores annually in Chkalovsk. From the beginning of the uranium industry in Tajikistan, more than 55 million tons of total waste was generated within 10 uranium tailings covering an area of 170 hectares with a summary activity of more than 6,5 thousand curies.

In complex №6 of Chkalovsk city different types of silicate and carbonate uranium ores from Uzbekistan, Russia, Kazakhstan and Kyrgyzstan were reprocessed. The Taboshar (Tajikistan) and Min-Kush (Kyrgyzstan) deposits were carbonated. Carbonated ores were also delivered from Kazakhstan. Silicated uranium-bearing ores were delivered from the Tashkent oblast (Uzbekistan) and Chiti (Russia). Different methods for ores reprocessing were applied taking into account the distinct ore compositions.

Specialists of Chkalovsk complex, as far back as during the time of the Soviet Union, could determine the origin of U<sub>3</sub>O<sub>8</sub> (yellow cake) based on the type of raw material used in manufacturing. Utilizing uranium contents as well as different uranium isotope ratios it is possible to differentiate uranium concentrates.

Analysis of raw uranium materials is important in order to possibly determine the source of these materials and is an important element of nuclear forensics. Currently Tajikistan is developing a basis for nuclear forensics. In this regard, a training center is established for specialists with orientation to nuclear safety and nuclear security to include nuclear forensics. The development of a national nuclear forensic library has been initiated. A nuclear security infrastructure is being expanded to include analysis, interpretation, law enforcement and nuclear security elements to include the establishment of a nuclear materials illicit trafficking database.

Tajikistan is preparing the Amendment to the Convention on the Physical Protection of Nuclear Materials for ratification. Tajikistan maintains a national system for accounting of nuclear and radioactive materials. Improvements to the system for nuclear materials transportation and their storage are underway.

Tajikistan has boundaries with Afghanistan and the need for nuclear forensics experts is increasing every year. Due to continuing reports of narcotics transit cases, there is also the possibility for the unauthorized transit of nuclear materials from north to south within the region. Threats from the illicit trafficking of nuclear materials remains an urgent problem in Tajikistan and relies on a nuclear forensic capability as part of a national response plan. Tajikistan recognizes the technical strengths of nuclear forensics to address the international concern posed by illicit trafficking. In order to effectively combat the threat of nuclear and other radioactive material out of regulatory control, it is necessary to have very close international cooperation. Tajikistan is committed to prompt reporting to the IAEA Incident and Trafficking Database (ITDB) of all cases involving the illicit trafficking of nuclear or other radioactive materials. In this regard, Tajikistan recognizes that the ITDB in combination with a national nuclear forensics capability are essential tools for nuclear security.

### **Country and/or Institution**

Tajikistan/Nuclear and Radiation Safety Agency

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